APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/737,259	12/14/2000	Xiaoqiang Luo	YOR20000737US1 (590.033)	1915

35195	7590	08/06/2004

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EXAMINER
SHORTLEDGE, THOMAS E

ART UNIT	PAPER NUMBER
2654	

DATE MAILED: 08/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is

closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All   b)☐ Some *   c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage

application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2/25/02

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

Claim Rejections - 35 USC § 112

1.   Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 18 recites the limitation "said step adapter" in line 1 of claim 18. There is insufficient antecedent basis for this limitation in the claim.

The examiner has interpreted this as a reference to the "adapter" recited in the parent claims.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3.   Claims 1 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Miller et al. (Fully Statistical Approach to Natural Language Interfaces).

As to claim 1 and 13, Miller et al. teach:

the statistical parser including a statistical model which decodes at least

one type of input (a statistical parsing model within a natural language interface

system with input utterances, page 55, left column);

an adapter that adapts the statistical model via employing a mathematical

transform (the parsing model is searched using a decoder based on an

adaptation of the Early parsing algorithm, page 58, left column).

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described
> as set forth in section 102 of this title, if the differences between the subject matter sought to
> be patented and the prior art are such that the subject matter as a whole would have been
> obvious at the time the invention was made to a person having ordinary skill in the art to which
> said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

5.   Claims 2 – 24 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Miller et al. as stated above, and in view of Kita et al. (HMM Continuous

Speech Recognition Using Predictive LR Parsing).

As to claim 2 and 14 Miller et al. does not teach the mathematical

transform employed by said adapter comprises a Markov Transform.

However Kita et al. do teach updating probabilities using a Hidden Markov

Model phone probability calculation process (page 704, right column).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the parsing system of Miller et al. with the Markov calculations as taught by Kita et al. to further improve recognition accuracy as taught by Kita et al. (page 703, left column).

As to claims 3 and 15 Miller et al. does teach the statistical model is assigned, prior to adaptation, a probability mass function (the probability mass for each discourse-dependent meaning is focused on a single parse tree, page 56, right column).

As to claims 4 and 16, Miller et al. does not teach the probability mass function is written as a row vector.

However, Kita et al. do teach a vector probability array (page 704, right column), equivalent to a row vector.

Therefore it would have been obvious to one of ordinary skill of the art at the time of the invention to combine the parsing system of Miller et al. with the probability function usage of Kita et al. to conveniently arrange the probability data for updating by Kita's Markov transform.

As to claims 5 and 17, Miller et al. and Kita et al. do not teach of right-multiplying the row vector by a Markov matrix.

Official notice is taken that both the concept and advantages for updating a Markov model by right multiplying a row vector by a Markov matrix (or left

multiplying a column vector by a transpose of the Markov matrix) are well known and expected in the art. It would have been obvious to update the Markov model included in Miller et al. and Kita et al. to conveniently update the probabilities to improve the recognition accuracy and efficiency as taught by Kita et al. (page 703, left column).

As to claims 6 and 18, Miller at al. do not teach that the adapter is configured for choosing a Markov matrix such that the log probability of given material is maximized.

However, Kita et al. do teach of finding the highest and best probability (page 704, right column).

Therefore it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the parsing system of Miller et al. with the highest probability of Kita et al. to improve recognition accuracy as taught by Kita et al. (page 703, left column).

As to claims 7, 9 and 19, 21, Miller et al. do not explicitly teach unsupervised or supervised adaptation.

However, Kita et al. teach the use of Viterbi algorithm to update the probabilities, it can be run in either supervised or unsupervised modes

Therefore it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the parsing system of Miller et al. with the

unsupervised or supervised updating of Kita et al. to improve recognition accuracy as taught by Kita et al. (page 703, left column).

As to claims 8 and 20, Miller et al. do teach the employing of decoded parses of test material, (the system was trained using data from the Air Travel Information domain, page 55, right column)

As to claim 10 and 22, Miller et al. teach the adapter is configured to employ adaptation material, (training the model by estimating the transition probabilities, col. 1, page 58).

As to claim 11 and 23 Miller et al. teach that the statistical model decodes linguistic input (the parser is part of a natural language interface system (page 55, left column, which inherently accepts a linguistic input).

As to claims 12 and 24 Miller et al. teach that the statistical model decodes speech input and speech recognition (a natural language interface system that is fully integrated, resulting in an end-to-end system that maps input utterances into meaning representation frames).

6.   Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miller et al. in view of Coughlin (5,878,386).

Miller et al. teach:

the statistical parser including a statistical model which decodes at least one type of input (a statistical parsing model within a natural language interface system with input utterances, page 55, left column);

an adapter that adapts the statistical model via employing a mathematical function (the parsing model is searched using a decoder based on an adaptation of the Early parsing algorithm, page 58, left column).

Miller et al. do not teach a program storage device readable by a machine, tangibly embodying a program of instructions.

However, Coughlin teaches a natural language parser implemented on a computer with a central processing unit and a storage device, with a program of instructions (parser stored in memory, Fig. 3, element 62).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention the implement the parser unit of Miller et al. with the computer program of Coughlin to enable updating and to increase the accuracy of the parser, as taught by Coughlin (col. 5, lines 4-5).

Conclusion

7.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Weise (6,275,791), Nagai et al. (6,058,365), Downey (6,078,884), and Goddeau et al. (Integrating Probabilistic LR Parsing into Speech Understanding Systems).

Weise teaches a natural language parser that is capable of making
adjustments to increase the accuracy of a parse.

Nagai et al. teach using Hidden Markov Models within a left to right parser.

Downey teaches a pattern recognition system containing a parser using
Hidden Markov Models.

Goddeau et al. teach integrating a parser within a speech processing
system and generating recognition results.

8.   Any inquiry concerning this communication or earlier communications from
the examiner should be directed to Thomas E Shortledge whose telephone
number is (703)605-1199. The examiner can normally be reached on M-F 8:00 -
4:30.

If attempts to reach the examiner by telephone are unsuccessful, the
examiner's supervisor Talivaldis Smits can be reached on (703)306-3011. The
fax phone number for the organization where this application or proceeding is
assigned is 703-872-9306.

Information regarding the status of an application may be obtained from

the Patent Application Information Retrieval (PAIR) system. Status information

for published applications may be obtained from either Private PAIR or Public

PAIR. Status information for unpublished applications is available through

Private PAIR only. For more information about the PAIR system, see http://pair-

direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-

free).

TS
7/30/04

RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER